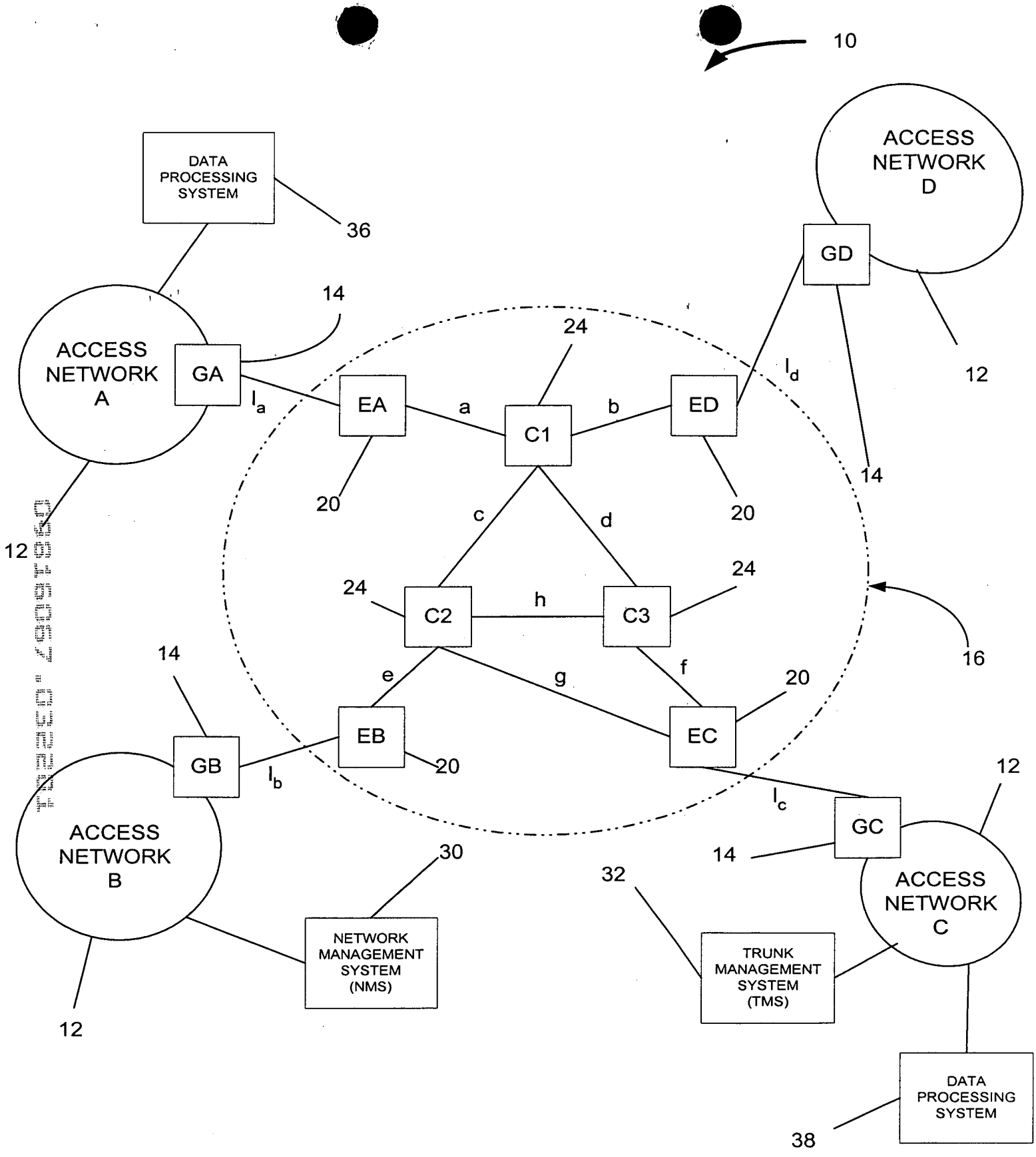
10
DATA PROCESSING SYSTEM
36
ACCESS NETWORK D
GD
14
ACCESS NETWORK A
GA
24
EA
a
C1
b
ED
l_d
12
l_a
20
20
14
c
d
12
24
24
C2
h
C3
16
14
e
g
f
20
EB
EC
GB
20
l_b
l_c
12
GC
ACCESS NETWORK B
30
14
32
ACCESS NETWORK C
NETWORK MANAGEMENT SYSTEM (NMS)
TRUNK MANAGEMENT SYSTEM (TMS)
12
DATA PROCESSING SYSTEM
38

FIG_1

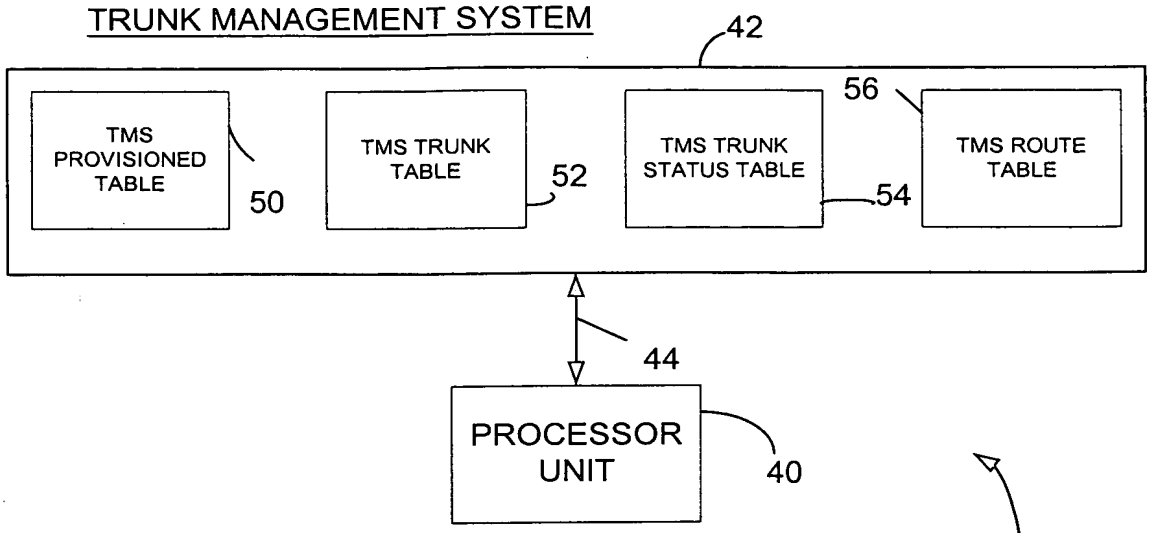
TRUNK MANAGEMENT SYSTEM
42
TMS PROVISIONED TABLE
50
TMS TRUNK TABLE
52
TMS TRUNK STATUS TABLE
54
56
TMS ROUTE TABLE
44
PROCESSOR UNIT
40
32

FIG_2

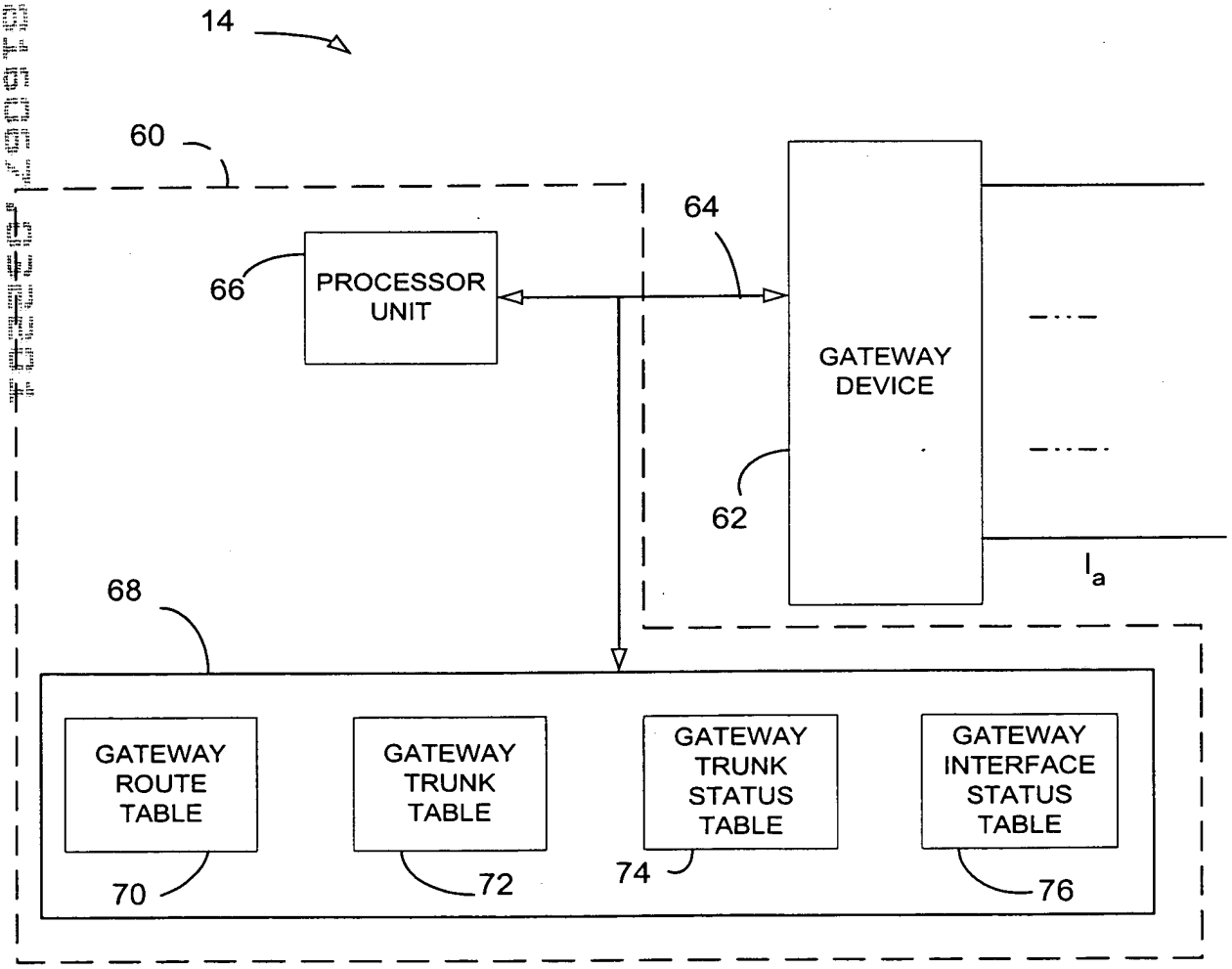
14
60
64
66
PROCESSOR UNIT
GATEWAY DEVICE
62
I_a
68
GATEWAY ROUTE TABLE
70
GATEWAY TRUNK TABLE
72
GATEWAY TRUNK STATUS TABLE
74
GATEWAY INTERFACE STATUS TABLE
76

FIG_3

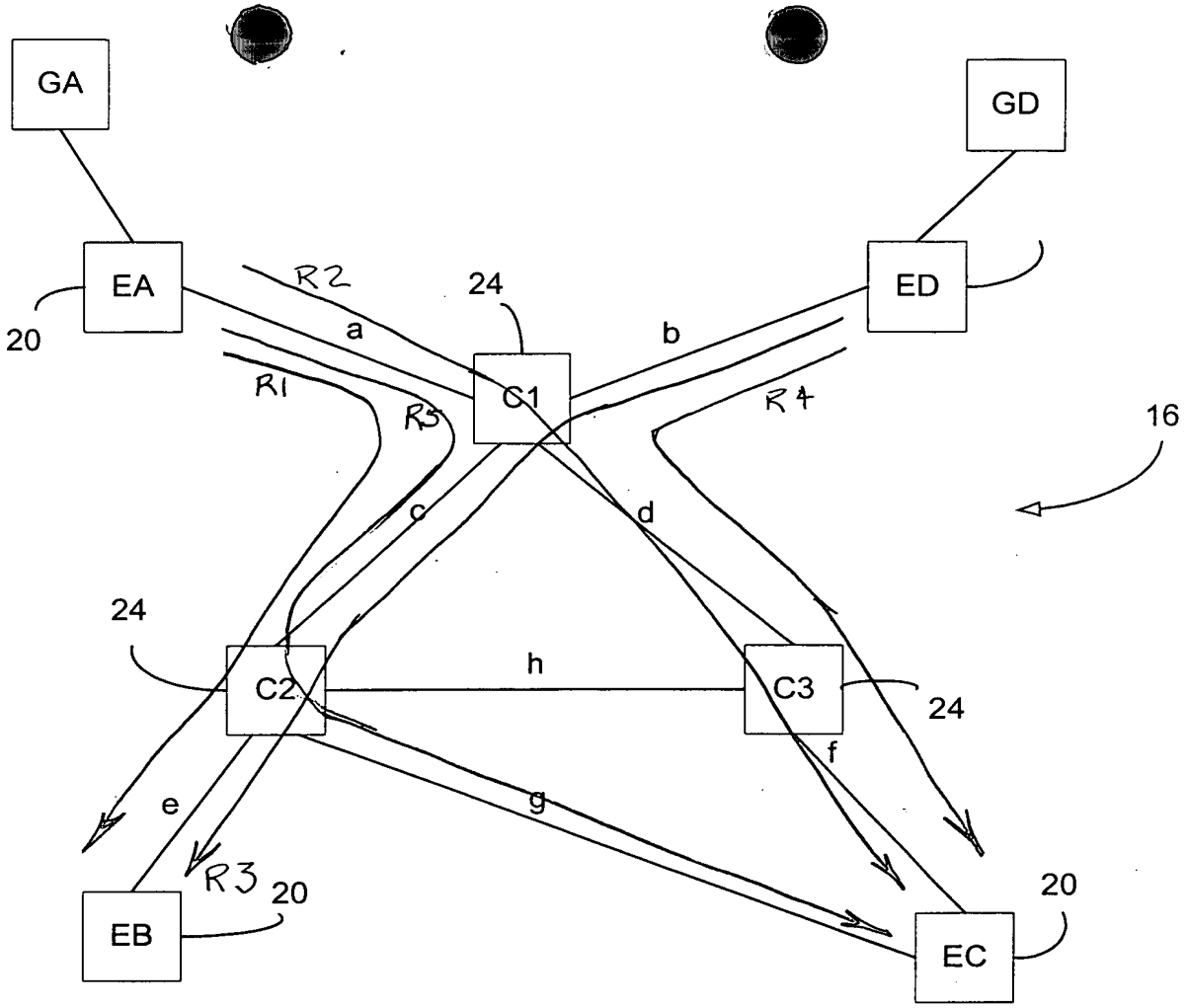

FIG_4

TMS ROUTE TABLE

Gateway	Connection	Route	Link
GA	EA-EB	R1	a, c, e
	EA-EC	R2	a, d, f
		R5	a, c, g
GD	ED-EB	R3	b, c, e
	ED-EC	R4	b, d, f

FIG_5

80A

Gateway	Connection	Route	Link
GA	EA -> EB	R1	a, c, e
	EA -> EC	R2	a, d, f
		R5	a, c, g

FIG_6A

80B

Gateway	Connection	Route	Link
GD	ED -> EB	R3	b, c, e
	ED -> EC	R4	b, d, f

FIG_6B

92 94

Provisioned Link	Bandwidth
EA->C1	100
C1->C2	100
C2->EB	100
ED->C1	100
E1->C3	100
C3->EC	100
C2->EC	50

90

FIG_7

GATEWAY (GA) TRUNK TABLE

104

106

Trunk	Provisioned Link	Bandwidth
Aa	EA->C1	100
Ac	C1->C2	50
Ad	C1->C3	50
Ae	C2->EB	50
Af	C3->EC	50
Ag	C2->EC	50

100A

102

FIG_8A

100B

GATEWAY (GD) TRUNK TABLE

102

104

106

Trunk	Provisioned Link	Bandwidth
Db	ED->C1	100
Dc	C1->C2	50
Dd	C1->C3	50
De	C2->EB	50
Df	C3->EC	50

FIG_8B

TMS TRUNK STATUS TABLE

110

Gateway	Trunk (112)	Provisioned Link (114)	Bandwidth (116)	Used (122)	Available (124)
GA	Aa	EA->C1	100	90	10
	Ac	C1->C2	50	40	10
	Ad	C1->C3	50	50	0
	Ae	C2->EB	50	40	10
	Af	C3->EC	50	50	0
	Ag	C2->EC	50	0	50
GD	Db	ED->C1	100	90	10
	Dc	C1->C2	50	50	0
	Dd	C1->C3	50	40	10
	De	C2->EB	50	50	0
	Df	C3->EC	50	40	10

FIG_9

130A

GATEWAY (GA) TRUNK STATUS TABLE

Trunk	Provisioned Link	Bandwidth	Used	Available	Link
Aa	EA->C1	100	90	10	a
Ac	C1->C2	50	40	10	c
Ad	C1->C3	50	50	0	d
Ae	C2->EB	50	40	10	e
Af	C3->EC	50	50	0	f
Ag	C2->EC	50	0	50	g

FIG_10A

130D

GATEWAY (GD) TRUNK STATUS TABLE

Trunk	Provisioned Link	Bandwidth	Used	Available	Link
Db	ED->C1	100	90	10	b
Dc	C1->C2	50	50	0	c
Dd	C1->C3	50	40	10	d
De	C2->EB	50	50	0	e
Df	C3->EC	50	40	10	f

FIG_10B

140A

INTERFACE STATUS TABLE (GATEWAY GA)

Interface	Bandwidth	Used	Available
G(1)	100	80	20
G(2)	50	20	30
G(3)	50	30	20
G(4)	50	10	40
G(5)	50	20	30

FIG_11

Serial No. 09/752,565

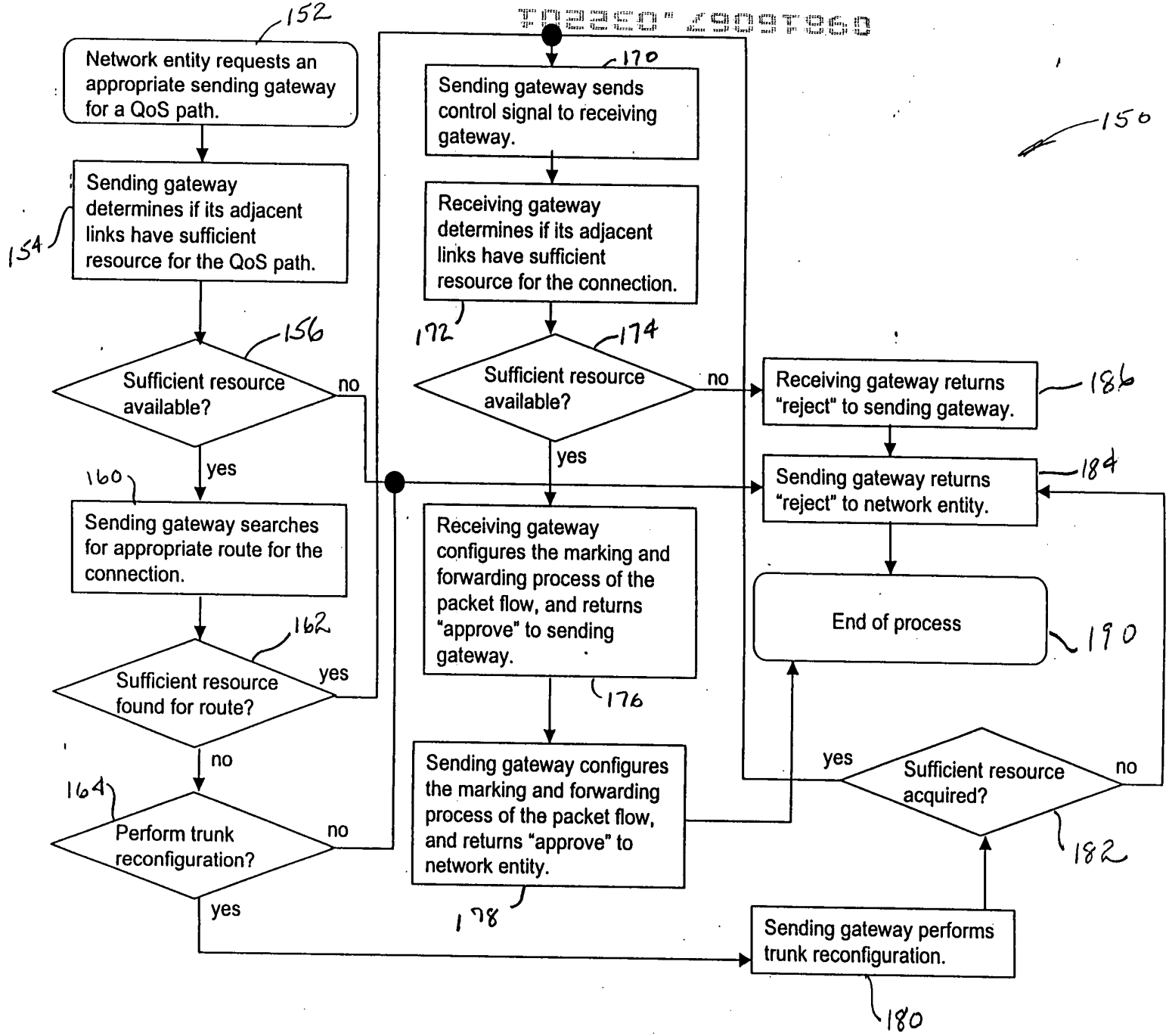
150
152
Network entity requests an appropriate sending gateway for a QoS path.
154
Sending gateway determines if its adjacent links have sufficient resource for the QoS path.
156
Sufficient resource available?
no
yes
160
Sending gateway searches for appropriate route for the connection.
162
Sufficient resource found for route?
yes
no
164
Perform trunk reconfiguration?
no
yes
170
Sending gateway sends control signal to receiving gateway.
172
Receiving gateway determines if its adjacent links have sufficient resource for the connection.
174
Sufficient resource available?
no
yes
176
Receiving gateway configures the marking and forwarding process of the packet flow, and returns "approve" to sending gateway.
178
Sending gateway configures the marking and forwarding process of the packet flow, and returns "approve" to network entity.
180
Sending gateway performs trunk reconfiguration.
182
Sufficient resource acquired?
yes
no
184
Sending gateway returns "reject" to network entity.
186
Receiving gateway returns "reject" to sending gateway.
190
End of process

FIG_12

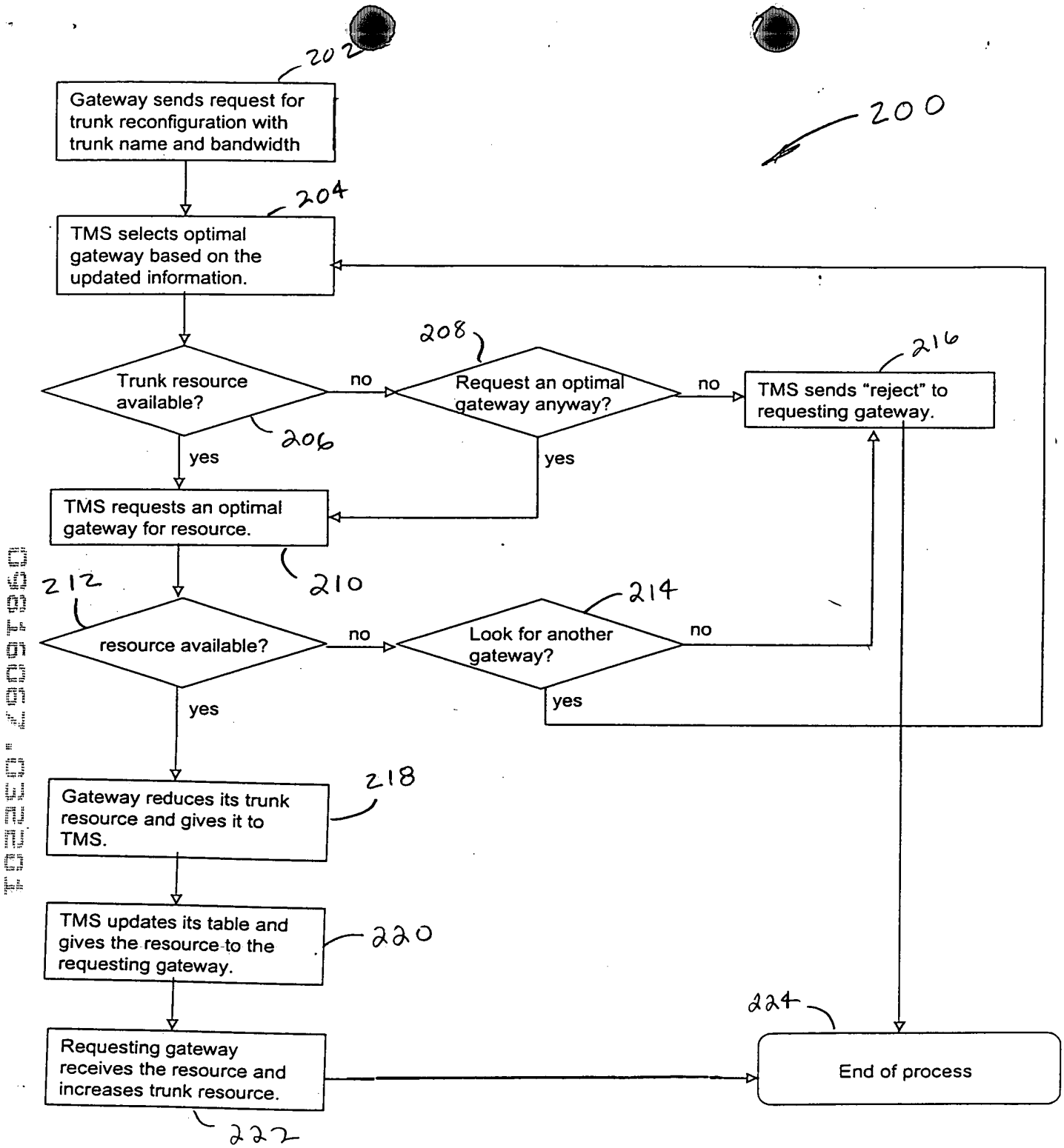
200
202
Gateway sends request for trunk reconfiguration with trunk name and bandwidth
204
TMS selects optimal gateway based on the updated information.
Trunk resource available?
206
no
208
Request an optimal gateway anyway?
no
216
TMS sends "reject" to requesting gateway.
yes
yes
TMS requests an optimal gateway for resource.
210
212
resource available?
no
214
Look for another gateway?
no
yes
yes
218
Gateway reduces its trunk resource and gives it to TMS.
TMS updates its table and gives the resource to the requesting gateway.
220
224
Requesting gateway receives the resource and increases trunk resource.
End of process
222

FIG_13